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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/541,222	07/01/2005	Soichiro Kawakami	03500.000345.	4982

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FITZPATRICK CELLA HARPER & SCINTO
30 ROCKEFELLER PLAZA
NEW YORK, NY 10112

EXAMINER	
HAN, KWANG S	

ART UNIT	PAPER NUMBER
1795	

MAIL DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/541,222	KAWAKAMI ET AL.	
	Examiner	Art Unit	
	Kwang Han	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 October 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9 and 11-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9 and 11-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *01 July 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *12/14/06,1/5/07*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

ELECTRODE MATERIAL FOR LITHIUM SECONDARY BATTERY AND ELECTRODE STRUCTURE HAVING THE ELECTRODE MATERIAL

Examiner: K. Han SN: 10/541,222 Art Unit: 1795 December 29, 2008

Election/Restrictions

1. Applicant's election without traverse of Group I, claims 1-9 and 11-19, in the reply filed on October 16, 2008 is acknowledged. Claim 10 has been cancelled by the Applicant.

Priority

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-8 and 13-18 are rejected under 35 U.S.C. 102(b) as being anticipated by Idota et al. (US 6235427).

Regarding claim 1, Idota is directed towards an electrode material for a lithium secondary battery comprised of particles of a solid state silicon alloy having an

amorphous material including alkaline earth metals, transitions metals, or semi-metals (Column 1, Lines 47-60; Column 3, Lines 4-20).

Regarding claim 2, Idota discloses the solid state alloy being a solid solution (Column 3, Lines 9-10).

Regarding claim 3, Idota discloses the alloy undergoing reactions on cooling (Column 3, Lines 12-14). The alloy would inherently be mixed in a melted liquid state before the cooling occurs. A reference which is silent about a claimed invention's features is inherently anticipatory if the missing feature *is necessarily present in that which is described in the reference*. In re Robertson, 49 USPQ2d 1949 (1999).

Regarding claims 4 and 5, Idota discloses an alloy composed of silicon and two or more elements including tin, gallium, aluminum, silver, zinc, and titanium (Column 3, Lines 16-27).

Regarding claim 6, Idota discloses a ratio of the alloying metals other than silicon to be between 5 to 2000% by weight (Column 3, Lines 21-27).

Regarding claims 7 and 8, Idota discloses the alloy containing a eutectic including eutectics formed from silicon and an element selected tin, gallium, aluminum, silver, zinc, and titanium (Column 3, Lines 4-27).

Regarding claim 13, Idota discloses particles of the silicon alloy having a preferable average particle diameter range of 0.001 to 5 μm.

Regarding claim 14, Idota discloses the particles of the alloy having the form of fine powder (Column 3, Lines 25-38).

Regarding claims 15 and 17, Idota discloses the material for the electrode comprised of a mixture of silicon alloy and a carbonaceous material which is employed as a conducting agent (Column 7, Lines 49-53).

Regarding claim 16, Idota discloses an electrode structure which includes a conductive agent, a binder, and a current collector (Column 2, Lines 3-13).

Regarding claim 18, Idota discloses a positive electrode active material capable of intercalating and deintercalating lithium and the negative electrode material capable of intercalating and deintercalating lithium (Column 1, Lines 50-60). A reference which is silent about a claimed invention's features is inherently anticipatory if the missing feature *is necessarily present in that which is described in the reference.* In re Robertson, 49 USPQ2d 1949 (1999).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. Claims 9, 11, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Idota et al. as applied to claim 1 above, and further in view of Suzuki et al. (US 2002/0146623).

Regarding claims 9, 11, and 12, the teachings of Idota as discussed above are herein incorporated. Idota is silent as to the electrode material being doped with boron.

Suzuki teaches a lithium secondary battery with a silicon material electrode which contains doped boron [0069] in the amount of 0.1 to 50 wt. % (0.1 wt% silicon would have an atomic ratio of approximately 0.0026 relative to silicon) for the benefit of providing improved capacity loss and fine cycle properties while retaining a large discharge capacity [0015, 0016]. It would have been obvious to one of ordinary skill in the art at the time of the invention to use a silicon based electrode which contains doped boron for lithium secondary material because Suzuki teaches it provides for improved capacity loss and fine cycle properties while retaining a large discharge capacity.

8. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Idota et al. as applied to claim 18 above and further in view of Nakanishi et al. (WO 2001/41249 using US 6723472 for translation and citation).

Regarding claim 19, the teachings of Idota as discussed above are herein incorporated. Idota discloses the positive electrode being a lithium-transition metal

complex oxide (Abstract) but is silent towards this material comprising yttrium or yttrium and zirconium.

Nakanishi teaches a lithium secondary battery which positive electrode materials containing elements from Groups IIIB and IVB of the periodic table (i.e. yttrium, zirconium) for the benefit of forming a battery with high rate and low-temperature characteristics because addition of these elements causes change in the surface state of the active material to increase the surface area (Column 1, Lines 50-59; Column 5, Lines 10-25). It would have been obvious to one of ordinary skill in the art at the time of the invention to use elements including yttrium and zirconium in the positive electrode because Nakanishi teaches it provides positive electrodes for batteries having high-rate and low-temperature characteristics.

Contact/Correspondence Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kwang Han whose telephone number is (571) 270-5264. The examiner can normally be reached on Monday through Friday 8:00am to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dah-Wei Yuan can be reached on (571) 272-1295. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/K. H./
Examiner, Art Unit 1795

/Dah-Wei D. Yuan/
Supervisory Patent Examiner, Art Unit 1795